

**Rotifera from Korean Inland Waters V. *Keratella* and *Notholca* of
Brachionidae (Rotifera: Monogononta)**

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韓國 淡水産 輪形動物 V. Brachionidae의 2屬 *Keratella*와 *Notholca*(Rotifera :
Monogononta)

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摘 要

韓國 淡水産 輪蟲類의 分類學的 研究을 위하여 1990年 3月부터 1992년 2月까지 全國 일대에 散在해 있는 댐, 호수, 저수지, 연못, 논, 웅덩이 등을 대상으로 總 205개 지점에서 採集을 實施하여 調査한 결과, Brachionidae 科의 *Keratella* 屬에 3亞種 3型과, *Notholca* 屬에 1亞種이 밝혀졌는데, 그중 *Keratella* 屬의 1형 *Keratella quadrata* f. *testudo*가 韓國 未記錄으로 판명되어 記載와 함께 도판을 作成하였고, 本 研究에서 確認된 *Keratella*와 *Notholca* 屬에 속하는 種들에 대한 檢索表를 만들고 (재)기재하였다. 따라서 지금까지 記錄된 韓國産 輪形動物은 總 2綱 4目 14科 40屬 135種, 15亞種, 9變種, 10型이 된다.

Key words: freshwater Rotifera, taxonomy, Korea.

INTRODUCTION

Because of their small size, rotifers constitute only a relatively minor part of the biomass of the zooplankton.

Nevertheless, the part played by rotifers in the production cycle is of considerable importance, partly because of their rapid turnover and metabolism (Ruttner-Kolisko, 1974).

Reproduction of rotifers is a heterogonic alternation of generations. Amictic eggs which undergo one equational maturation division are diploid, and develop parthenogenetically into diploid females. Such parthenogenetic reproduction continues until mictic females are produced in response to particular environments. Mictic eggs which undergo meiotic maturation divisions are haploid, and develop either into haploid males parthenogenetically or into encysted, dormant embryos called resting eggs if fertilized. Resting eggs always hatch into amictic females (Gilbert, 1977; Hyman, 1951). Such a complicated life cycle is diagrammatically displayed in Figure 1.

145 species of Korean freshwater Rotifera were listed by Song (1989). Thereafter, studies on this taxon have been continued by Chung *et al.* (1990, 1991a, 1991b, 1992a, 1992b) and Song and Kim (1989). This fifth series of the Korean Rotifera deals with the Korean specimens of the family Brachionidae (*Keratella*, *Notholca*). We provide not only the key to the Korean Rotifera for the first time but also (re)described all the species classified in this study.

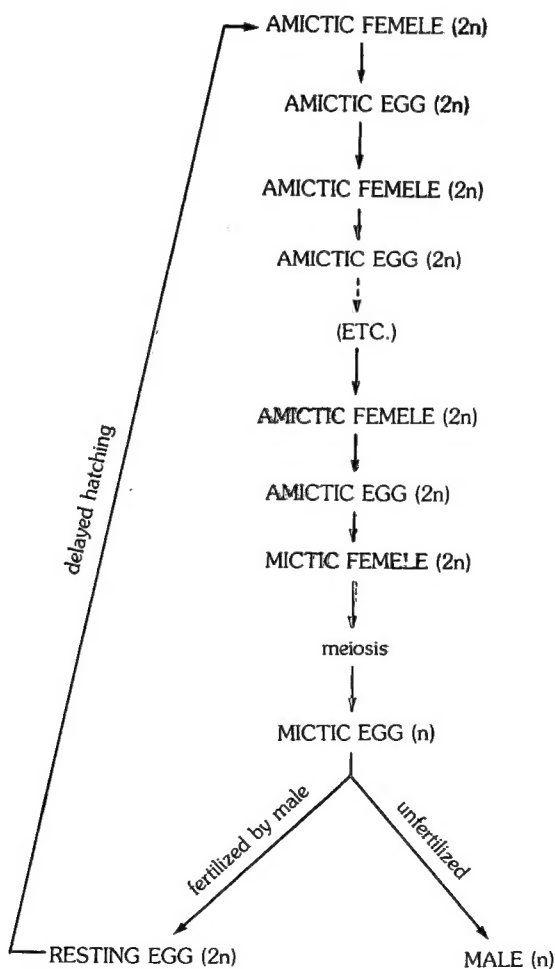


Fig. 1. Diagram of the heterogonic reproduction of rotifers (after Pennak, 1953).

MATERIALS AND METHODS

This study was based on the materials collected, during the period from March 1990 to February 1992, at 205 sites in Korea (Chung *et al.*, 1991b). All specimens reported here are deposited in the Department of Biology Education, Chonnam National University. The classification system was mainly based on Koste (1978) and Mizuno and Takahashi (1991).

SYSTEMATIC ACCOUNTS

Phylum Rotifera Cuvier, 1798 유행동물 문
Class Monogononta Plate, 1889 단성 강
Order Ploima Hudson and Gosse, 1886 유형 목
Family Brachionidae Wesenberg-Lund, 1899
Genus *Keratella* (Bory de St. Vincent, 1822)

Key to the species of *Keratella*

- 1 One or two posterior spines developed 2
Posterior spines wanting 5
- 2(1) Posterior spine single and median. Antero-lateral spines shorter than medians, not bowed
..... *K. cochlearis cochlearis*
- Two posterior spines are developed 3
- 3(2) Posterior width of body greater than anterior width 4
Posterior width of body less than anterior width *K. valga valga*
- 4(3) Two posterior spines parallel or very slightly divergent *K. quadrata quadrata*
One posterior spine is deposited right (dorsal view) *K. quadrata f. testudo*
- 5(1) Typical carinal plaques not developed. Anterior spines with six, intermediate and lateral spines usually curved or even hooked on the variety *K. curiformis f. eichwaldi*
Typical carinal plaques developed. Median line unbroken by an accessory median plaque
..... *K. cochlearis f. tecta*

1. *Keratella cochlearis cochlearis* (Gosse, 1851) (Pl.I, Fig. 1)

Anuraea cochlearis Gosse, 1851 (p.202); Hudson and Gosse, 1886 (vol.2, p.124, pl.29, fig.7); Collin *et al.*, 1912 (p.221, figs.434-435).

Keratella cochlearis : Harring, 1913 (p.56); Rylov, 1935 (T.8, fig.74, T.9, fig.77); Tafall, 1942 (p.62, pl.12, figs.123-125, 128-130); Ahlstrom, 1943 (pp.420-424, pl.35, figs.1-14); Yamamoto, 1952 (p.25, fig.73a); Berzins, 1954 (p.324, figs.2-3); Gillard, 1967 (p.8, fig.7); Ruttner-Kolisko, 1974 (p.73, fig.33c:18); Pontin, 1978 (p.66, fig.52a-d, fig.131a-b); Mamaril and Fernando, 1978 (p.124, fig.47).

Keratella cochlearis var. *cochlearis* : Mizuno and Takahashi, 1991 (p.224, fig.75).

Keratella cochlearis cochlearis : Koste, 1978 (p.112, T.23:11a-b, 12a, 24:1a-d; Abb.29a-b); Koste and Shiel, 1987

(pp.1008-1009, fig.31:1a-c).

Material examined : 1 ind., st.2, 29 X 1990; 40 inds., st.5, 29 X 1990; 15 inds., st.9, 28 X 1990; 4 inds., st.10, 28 X 1990; 4 inds., st.12, 28 X 1990; 15 inds., st.24, 26 IX 1990; 11 inds., st.27, 26 IX 1990; 1 ind., st.29, 26 IX 1990; 8 inds., st.31, 27 IX 1990; 20 inds., st.32, 25 IX 1990; 2 inds., st.34, 28 IX 1990; 2 inds., st.35, 28 IX 1990; 2 inds., st.38, 27 IX 1990; 3 inds., st.41, 24 IX 1990; 1 ind., st.51, 8 VIII 1990; 12 inds., st.74, 5 IV 1990; 11 inds., st.75, 5 IV 1990; 2 inds., st.78, 13 X 1990; 7 inds., st.80, 14 X 1990; 2 inds., st.83, 13 X 1990; 3 inds., st.85, 15 X 1990; 15 inds., st.88, 15 X 1990; 14 inds., st.90, 15 X 1990; 4 inds., st.97, 14 X 1990; 6 inds., st.98, 14 X 1990; 1 ind., st.101, 14 X 1990; 2 inds., st.102, 25 IX 1990; 11 inds., st.104, 25 IX 1990; 6 inds., st.105, 25 IX 1990; 1 ind., st.107, 25 IX 1990; 8 inds., st.109, 26 IX 1990; 13 inds., st.110, 26 IX 1990; 2 inds., st.112, 26 IX 1990; 11 inds., st.118, 27 IX 1990; 1 ind., st.125, 5 IV 1990; 2 inds., st.126, 5 IV 1990; 6 inds., st.127, 5 IV 1990; 5 inds., st.128, 5 IV 1990; 11 inds., st.129, 3 XI 1990; 19 inds., st.130, 3 XI 1990; 1 ind., st.131, 3 XI 1990; 4 inds., st.133, 3 XI 1990; 6 inds., st.138, 27 V 1990; 11 inds., st.142, 10 VI 1990; 8 inds., st.144, 10 VI 1990; 11 inds., st.145, 26 V 1990; 2 inds., st.146, 26 V 1990; 25 inds., st.148, 3 XI 1990; 3 inds., st.151, 25 IV 1990; 2 inds., st.152d, 7 XI 1990; 2 inds., st.152e, 21 XI 1990; 12 inds., st.152f, 24 XII 1990; 4 inds., st.153, 29 IV 1990; 36 inds., st.154, 29 IV 1990; 44 inds., st.155, 29 IV 1990; 5 inds., st.156, 29 IV 1990; 25 inds., st.157, 29 IV 1990; 39 inds., st.159, 29 IV 1990; 2 inds., st.161, 27 VII 1990; 1 ind., st.162, 29 IV 1990; 2 inds., st.163, 29 IV 1990; 2 inds., st.165, 29 VII 1990; 2 inds., st.166, 28 VII 1990; 3 inds., st.168, 28 IV 1990; 18 inds., st.171, 28 IV 1990; 10 inds., st.173, 15 IV 1990; 15 inds., st.174, 15 IV 1990; 5 inds., st.175, 15 IV 1990; 1 ind., st.176, 15 IV 1990; 2 inds., st.177, 15 IV 1990; 5 inds., st.178, 15 IV 1990; 22 inds., st.179, 23 XII 1990; 26 inds., st.180, 15 IV 1990; 5 inds., st.181, 15 IV 1990; 18 inds., st.182, 15 IV 1990; 21 inds., st.183, 5 V 1990; 3 inds., st.191, 29 IV 1990; 18 inds., st.192, 29 IV 1990; 12 inds., st.193, 29 IV 1990; 72 inds., st.194, 29 IV 1990.

Description: Lorica terminates in a stout median posterior spine which usually varies in length seasonally and cyclically. The shape oval, depth of the dorsal plate a little more than half the width. The length about two thirds as wide as long. Broadest in front. Anterior dorsal margin with six spines: median spines longest, curved toward ventrally, intermediates somewhat divergent, more or less shorter than laterals which are convergent at their tips and which arise at a slight angle toward the ventral. Posterior spine variable. The dorsal plate often somewhat pustulated. Length 125-150 μ , width 50-60 μ , anterior median spines 20-30 μ , posterior spine 5-40 μ . Most widely distributed and very common rotifera in nature.

Distribution: Cosmopolitan.

2. *Keratella cochlearis* f. *tecta* (Gosse, 1851)

(Pl.I, Fig. 2)

Anuraea tecta Gosse, 1851 (p.202); Hudson and Gosse, 1886 (vol.2, p.123, pl.29, fig.10).

Keratella tecta: Turner, 1986 (p.6, fig.2a); Koste and Shiel, 1987 (p.1010, fig.25:5a-b, 29:4).

Keratella cochlearis var. *tecta*: Yamamoto, 1952 (p.25, fig.73b).

Keratella cochlearis f. *tecta*: Rylov, 1935 (p.71, T.9, fig.77d); Tafall, 1942 (p.63, pl.12, figs.122, 126); Ahlstrom, 1943 (pp.425-426, pl.35, figs.15-16); Ruttner-Kolisko, 1974 (p.74, fig.33c:20); Pontin, 1978 (p.68, fig.53d).

Material examined: 18 inds., st.9, 28 X 1990; 5 inds., st.10, 28 X 1990; 4 inds., st.11, 28 X 1990; 3 inds., st.12, 28 X 1990; 19 inds., st.15, 27 X 1990; 6 inds., st.24, 26 IX 1990; 3 inds., st.25, 26 IX 1990; 8 inds., st.27, 26 IX 1990; 2 inds., st.28, 26 IX 1990; 1 ind., st.30, 27 IX 1990; 17 inds., st.32, 25 IX 1990; 44 inds., st.33, 25 IX 1990; 3 inds., st.36, 27 IX 1990; 1 ind., st.37, 27 IX 1990; 3 inds.,

st.41, 24 IX 1990; 8 inds., st.46, 25 IX 1990; 34 inds., st.47, 25 IX 1990; 5 inds., st.48, 25 IX 1990; 1 ind., st.49, 25 IX 1990; 2 inds., st.50, 25 IX 1990; 8 inds., st.52, 24 IX 1990; 17 inds., st.53, 8 VIII 1990; 3 inds., st.58, 9 VIII 1990; 18 inds., st.59, 9 VIII 1990; 2 inds., st.60, 8 VIII 1990; 3 inds., st.61, 9 VIII 1990; 4 inds., st.70, 7 VIII 1990; 1 ind., st.74, 5 IV 1990; 3 inds., st.75, 5 IV 1990; 7 inds., st.80, 14 X 1990; 3 inds., st.83, 13 X 1990; 2 inds., st.84, 15 X 1990; 14 inds., st.85, 15 X 1990; 8 inds., st.86, 15 X 1990; 29 inds., st.87, 15 X 1990; 11 inds., st.88, 15 X 1990; 5 inds., st.89, 15 X 1990; 16 inds., st.90, 15 X 1990; 18 inds., st.92, 15 X 1990; 68 inds., st.93, 15 X 1990; 18 inds., st.94, 16 X 1990; 36 inds., st.95, 16 X 1990; 9 inds., st.96, 16 X 1990; 3 inds., st.97, 14 X 1990; 1 ind., st.98, 14 X 1990; 1 ind., st.99, 14 X 1990; 16 inds., st.100, 14 X 1990; 1 ind., st.102, 25 IX 1990; 9 inds., st.103, 25 IX 1990; 6 inds., st.106, 25 IX 1990; 1 ind., st.109, 26 IX 1990; 21 inds., st.110, 26 IX 1990; 21 inds., st.113, 26 IX 1990; 13 inds., st.115, 27 IX 1990; 1 ind., st.116, 27 IX 1990; 42 inds., st.117, 27 IX 1990; 9 inds., st.118, 27 IX 1990; 2 inds., st.121, 5 IV 1990; 11 inds., st.124, 5 IV 1990; 2 inds., st.127, 5 IV 1990; 2 inds., st.128, 5 IV 1990; 42 inds., st.129, 3 XI 1990; 39 inds., st.130, 3 XI 1990; 4 inds., st.131, 3 XI 1990; 21 inds., st.132, 3 XI 1990; 11 inds., st.133, 3 XI 1990; 2 inds., st.135, 27 V 1990; 3 inds., st.136, 27 V 1990; 5 inds., st.139, 27 V 1990; 32 inds., st.140, 27 V 1990; 3 inds., st.141, 10 VI 1990; 4 inds., st.144, 10 VI 1990; 4 inds., st.145, 26 V 1990; 3 inds., st.146, 26 V 1990; 42 inds., st.148, 3 XI 1990; 1 ind., st.152b, 20 IX 1990; 1 ind., st.161, 27 VII 1990; 16 inds., st.165, 29 VII 1990; 3 inds., st.166, 28 VII 1990; 5 inds., st.168, 28 IV 1990; 31 inds., st.170, 20 V 1990; 11 inds., st.171a, 17 V 1990; 6 inds., st.171b, 17 IX 1990; 2 inds., st.171c, 10 XI 1990; 3 inds., st.172, 3 X 1990; 6 inds., st.173, 15 IV 1990; 8 inds., st.174, 15 IV 1990; 2 inds., st.177, 15 IV 1990; 3 inds., st.178, 15 IV 1990; 20 inds., st.179, 23 XII 1990; 22 inds., st.180, 15 IV 1990; 3 inds., st.184, 5 V 1990; 2 inds., st.185, 27 V 1990; 3 inds., st.186, 21 IV 1990; 5 inds., st.187, 15 IV 1990; 4 inds., st.188, 15 IV 1990; 2 inds., st.197, 24 VII 1990.

Description: Reduced pattern as in typical *K. cochlearis*. Not present posterior spine. The body oval. The anterior spines reduced in some habitats. The intermediate and lateral spines more reduced than medians and almost rounded at the top. The ventral plate somewhat pustulated, dorsal plate usually not pustulation. The median line may have a jog to the right behind the anterior carinal plaques. The posterior carinal plaques almost completely formed. Length 105-130 μ , width 55-70 μ , anterior median spines 15-20 μ .

Distribution: Cosmopolitan.

3. *Keratella valga valga* (Ehrenberg, 1834)

(Pl.II, Fig. 1)

Anuraea valga Ehrenberg, 1834 (p.198; 1838, p.508, pl.62, fig.15; cited from Ahlstrom, 1943); Hudson and Gosse, 1889 (p.55, p.34, fig.30).

Keratella valga: Yamasaki, 1933 (p.30, figs.19-35); Edmondson and Hutchinson, 1934 (pp.169-170, fig.4,B-E); Ahlstrom, 1943 (pp.448-451, pl.42, figs.1-21); Yamamoto, 1952 (p.27, fig.76a-e); Pontin, 1978 (p.71, fig.55); Koste and Shiel, 1987 (pp.1001-1002, fig.27:2).

Keratella valga valga: Koste, 1978 (p.104, T.19:w).

Material examined: 55 inds., st.4, 29 X 1990; 1 ind., st.19, 29 X 1990; 2 inds., st.23, 26 IX 1990; 28 inds., st.24, 26 IX 1990; 2 inds., st.28, 26 IX 1990; 3 inds., st.29, 26 IX 1990; 11 inds., st.31, 27 IX 1990; 12 inds., st.32, 25 IX 1990; 18 inds., st.33, 25 IX 1990; 6 inds., st.36, 27 IX 1990; 2 inds., st.37, 27 IX 1990; 1 ind., st.39, 24 IX 1990; 2 inds., st.41, 24 IX 1990; 21 inds., st.46, 25 IX 1990; 1 ind., st.48, 25 IX 1990; 1 ind., st.49, 25 IX 1990; 13 inds., st.53, 8 VIII 1990; 16 inds., st.58, 9 VIII

1990; 1 ind., st.60, 8 VIII 1990; 7 inds., st.61, 9 VIII 1990; 3 inds., st.70, 7 VIII 1990; 7 inds., st.71, 7 VIII 1990; 2 inds., st.72, 7 VIII 1990; 20 inds., st.73, 9 VIII 1990; 17 inds., st.77, 13 X 1990; 1 ind., st.78, 13 X 1990; 1 ind., st.81, 13 X 1990; 3 inds., st.83, 13 X 1990; 8 inds., st.85, 15 X 1990; 2 inds., st.86, 15 X 1990; 1 ind., st.90, 15 X 1990; 3 inds., st.94, 16 X 1990; 1 ind., st.98, 14 X 1990; 3 inds., st.100, 14 X 1990; 8 inds., st.103, 25 IX 1990; 12 inds., st.105, 25 IX 1990; 11 inds., st.106, 25 IX 1990; 7 inds., st.109, 26 IX 1990; 18 inds., st.110, 26 IX 1990; 1 ind., st.111, 26 IX 1990; 2 inds., st.112, 26 IX 1990; 2 inds., st.113, 26 IX 1990; 10 inds., st.114, 27 IX 1990; 21 inds., st.115, 27 IX 1990; 4 inds., st.116, 27 IX 1990; 9 inds., st.118, 27 IX 1990; 3 inds., st.122, 5 IV 1990; 13 inds., st.134, 3.XI 1990; 3 inds., st.163, 29 IV 1990; 1 ind., st.164, 30 VII 1990; 2 inds., st.166, 28 VII 1990; 13 inds., st.167, 6 VIII 1990; 5 inds., st.171b, 17 IX 1990; 4 inds., st.171c, 10 XI 1990; 5 inds., st.176, 15 IV 1990; 2 inds., st.177, 15 IV 1990; 10 inds., st.180, 15 IV 1990; 5 inds., st.182, 15 IV 1990; 2 inds., st.184, 5 V 1990; 1 ind., st.191, 29 IV 1990; 6 inds., st.196, 24 VII 1990; 4 inds., st.197, 24 VII 1990.

Description: Lorica terminated in two unequal posterior spines, right spine longer than left, sometimes left spine absent even when right ones quite long, lorica quite compressed dorso-ventrally. Six anterior spines, reticulate sculpture forming a medial series of undivided hexagons, maximum width of lorica very distinctly greater than the posterior width. Posterior spines well developed, the right typically one-third and the left one-fourth of the length of the lorica, occasionally left spine absent. Punctuate and reticulate sculpture both present. Most common rotifera in warmer regions. Length 140-230 μ , width 65-80 μ , anterior median spines 20-32 μ , posterior right spine 25-80 μ .

Distribution: Cosmopolitan.

4. *Keratella quadrata quadrata* (O.F. Müller, 1786)

(Pl.II, Fig. 2)

Brachionus quadratus O.F. Müller, 1786 (p.354, pl.49, figs.12-13).

Anuraea brevispina: Gosse, 1851 (p.202).

Anuraea aculeata: Hudson and Gosse, 1886 (vol.2, p.123, pl.29, fig.4).

Keratella quadrata f. *divergens*, *frenzelii*, *quadrata*, *valgoides*: Edmondson and Hutchinson, 1934 (pp.166-169, fig.3, A-F).

Keratella quadrata: Harring, 1913 (p.57); Yamasaki, 1933 (p.29, figs.1-12); Rylov, 1935 (pp.66-70, T.8, figs.69,70a-d, T.9, fig.75); Yamamoto, 1952 (p.27, fig.75a); Ruttner-Kolisko, 1974 (p.72, fig.33b: 6); Pontin, 1978 (p.73, fig.58).

Keratella quadrata quadrata: Koste, 1978 (p.100, T.19: f-i, T.16: 2b-c, T.18: a-g); Koste and Shiel, 1987 (p.999, fig.25:1).

Material examined: 31 inds., st.74, 5 IV 1990; 18 inds., st.75, 5 IV 1990; 7 inds., st.121, 5 IV 1990; 2 inds., st.123, 5 IV 1990; 1 ind., st.124, 5 IV 1990; 1 ind., st.125, 5 IV 1990; 7 inds., st.127, 5 IV 1990; 3 inds., st.128, 5 IV 1990; 2 inds., st.153, 29 IV 1990; 4 inds., st.166, 28 VII 1990; 2 inds., st.173, 15 IV 1990; 2 inds., st.178, 15 IV 1990; 28 inds., st.179, 23 XII 1990; 2 inds., st.180, 15 IV 1990.

Description: Lorica much compressed dorso-ventrally, slightly narrow posterior ward. Broadest in the last third or on posterior margin, anterior spines straight. Especially lorica 2 closed median facets with forked ridges branching out from them. Anterior dorsal margin 6 spines: median two spines stoutest and longest, curved ventrally. Intermediates slightly divergent or somewhat convergent. Laterals usually more or less longer than intermediates. Posterior spines parallel or very slightly divergent, usually the right one larger than the left. Dorsal plate usually pustulated, but ventral plate lacks pustules. Behind the anterior median area three median facets, the anterior two of which are enclosed hexagons, similar to back of the turtle. Length 180-260 μ , width 75-95 μ , anterior median spines 25-45 μ , posterior right spine 45-75 μ . Habitates

in fresh and salt water.

Distribution: Denmark, America, North Europe, Japan, Korea.

5. *Keratella quadrata* f. *testudo* (Ehrenberg, 1832) (Pl.I, Fig. 3)

Anuraea testudo Ehrenberg, 1832 (p.145; 1838, p.507, pl.42, fig.12; cited from Ahlstrom, 1943); Hudson and Gosse, 1889 (p.55, pl.34, fig.31).

Keratella quadrata f. *brevispina*, *testudo*, *irregularis*: Edmondson and Hutchinson, 1934 (p.168).

Keratella quadrata f. *testudo*: Ahlstrom, 1943 (pp.444-445, pl.41, figs.1-3); Yamamoto, 1952 (p.27, fig.75d).

Material examined: 17 inds., st.179, 23 XII 1990; 6 inds., st.180, 15 IV 1990; 4 inds., st.182, 15 IV 1990.

Description: Foundation pattern as in typical *K. quadrata*, but posterior spines very short, about one-seventh of the length of the lorica, often somewhat divergent. The left posterior spine shorter than the right one or not present. The anterior dorsal six spines shorter than in typical *K. quadrata*, and anterior dorsal six spines much less curved forward. The length of spines variable in different localities from one-half as long to as long as the body. Lorica length about 153-166 μ , its width about 68-72 μ .

Remarks: Ahlstrom (1943) described that the length of spines in typical form varies in different localities from one-half as long to as long as the body, and this variation in length is definitely gradational. Lorica total length 172-385 μ , width 83-110 μ , body length 123-160 μ , posterior spine 27-182 μ , anterior spines from 22-16-18 μ to 38-40-60 μ . But Hudson & Gosse (1889) described that lorica quadrate; with six straight and nearly equal spines in front, and two short spines behind; both dorsal and ventral plates rough, the former tessellated. Lorica length 105-117 μ . Recently, this species varies in body and spines length. As a result, the Korean specimen is somewhat smaller than Ahlstrom (1943), but very similar to Hudson & Gosse (1886).

Distribution: England, America, Japan, Korea.

6. *Keratella cruciformis* f. *eichwaldi* (Levander, 1894) (Pl.I, Fig. 4)

Anuraea eichwaldi Levander, 1894 (p. 62, pl. 3, fig. 41; cited from Ahlstrom, 1943).

Keratella cruciformis var. *eichwaldi*: Ahlstrom, 1943 (p. 453, pl.38, fig.11); Yamamoto, 1953 (p.156, pl.1, figs.14-15).

Keratella eichwaldi: Koste and Shiel, 1987 (p.1006, fig.29:3).

Keratella cruciformis f. *eichwaldi*: Koste, 1978 (p.110, T.23:14).

Material examined: 56 inds., st.1, 28 X 1990; 2 inds., st.6, 28 X 1990; 2 inds., st.20, 30 X 1990.

Description: Lorica semi-elliptical and much compressed dorso-ventrally. Width about a half of the lorica. In dorsal view, two pairs of large plaques along the median line, while in the typical species there are three pairs of plaques. Anterior dorsal spines with six: medians long and straight, intermediate and lateral spines usually curved or even hooked on the tip. In the typical species, the lorica covered by a comparatively coarse areolate network but not pustulate on either plate. Length 135-155 μ , width 70-80 μ , anterior median spines 17-23 μ .

Distribution: Norway, Sweden, England, Japan, Korea.

Genus *Notholca* (Gosse, 1886)

7. *Notholca labis labis* Gosse, 1887

(Pl.II, Fig. 3)

Notholca labis Gosse, 1887 (p.871, pl.15:24); Hudson and Gosse, 1889 (p.57, pl.31, fig.56); Collin *et al.*, 1912 (p.226, fig.454); Ryllov, 1935 (p.75, T.10, fig.83); Yamamoto, 1949 (p.143, fig.26); Koch-Althaus, 1963 (p.424, Abb.34b); Ruttner-Kolisko, 1974 (p.78, fig.35b:10); Pontin, 1978 (p.77, figs.31; 62a-b); Koste and Shiel, 1987 (p.1013, fig.33:6a-b).

Notholca labis labis: Koste, 1978 (p.121, T.28:2A-E), Kim *et al.*, 1991 (p.551, fig.2).

Material examined: 3 inds., st.1, 28 X 1990; 1 ind., st.22, 26 IX 1990; 1 ind., st.126, 5 IV 1990; 1 ind., st.128, 5 IV 1990; 3 inds., st.168, 28 IV 1990.

Description: Caudal appendage shaped somewhat like a spatula, very variety. Elongate oval lorica with spade-shaped/rectangular caudal extension. Anterior dorsal margin with six spines: median and lateral spines approximately equal, intermediate spines shorter than others. Body thin walled smooth, rough longitudinal striations and rounded posteriorly. Lorica about twice as long as broad, dorso-ventrally flattened. Broad posterior spine-like extension of lorica present and of variable length, truncated and short. Foot absent, but rudimentary pedal glands present. Trophi malleate type. Length 145-160 μ , width 90-100 μ , anterior median spines about 11 μ , intermediates about 6 μ .

Distribution: America, England, Germany, Japan, Korea.

ABSTRACT

The systematic study of freshwater rotifers was conducted with the materials collected from 205-sites in South Korea. As a result, 4 subspecies, 3 forms of Family Brachionidae (*Keratella*, *Notholca*) were identified; of which, 1 form is new to the Korean fauna: *Keratella quadrata* f. *testudo*. Total 135 species, 15 subspecies, 9 varieties and 10 forms representing 14 families 40 genera are now recorded from Korea by adding the 1 form newly described in the present paper.

ACKNOWLEDGMENTS

The third author (S.Y. Kim) is very grateful to Dr. R. J. Shiel, Murray-Darling Freshwater Research Centre in Australia for his kind supplying some useful literatures.

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RECEIVED: 6 OCTOBER 1992

ACCEPTED: 14 NOVEMBER 1992

EXPLANATION OF PLATES

Plate I

- Fig. 1. *Keratella cochlearis cochlearis*: 1a, dorsal view; 1b, ventral view; 1c, lateral view.
- Fig. 2. *Keratella cochlearis* f. *tecta*: 2a, dorsal view; 2b, ventral view; 2c, lateral view with egg.
- Fig. 3. *Keratella quadrata* f. *testudo*: 3a, dorsal view; 3b, ventral view.
- Fig. 4. *Keratella cruciformis* f. *eichwaldi*: 4a, dorsal view; 4b, ventral view. Scale line 50µm.

Plate II

- Fig. 1. *Keratella vagla valga*: 1a, 1b, dorsal view; 1c, ventral view.
- Fig. 2. *Keratella quadrata quadrata*: 2a, dorsal view; 2b, lateral view with egg.
- Fig. 3. *Nothloca labis labis*: 3a, dorsal view; 3b, ventral view. Scale line 50µm.